

06 APR 2005

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
22 April 2004 (22.04.2004)

PCT

(10) International Publication Number
WO 2004/034381 A3

(51) International Patent Classification⁷: **G06F 17/00**,
G11B 5/09

(21) International Application Number:
PCT/US2003/031771

(22) International Filing Date: 6 October 2003 (06.10.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/416,091 6 October 2002 (06.10.2002) US
60/456,924 21 March 2003 (21.03.2003) US

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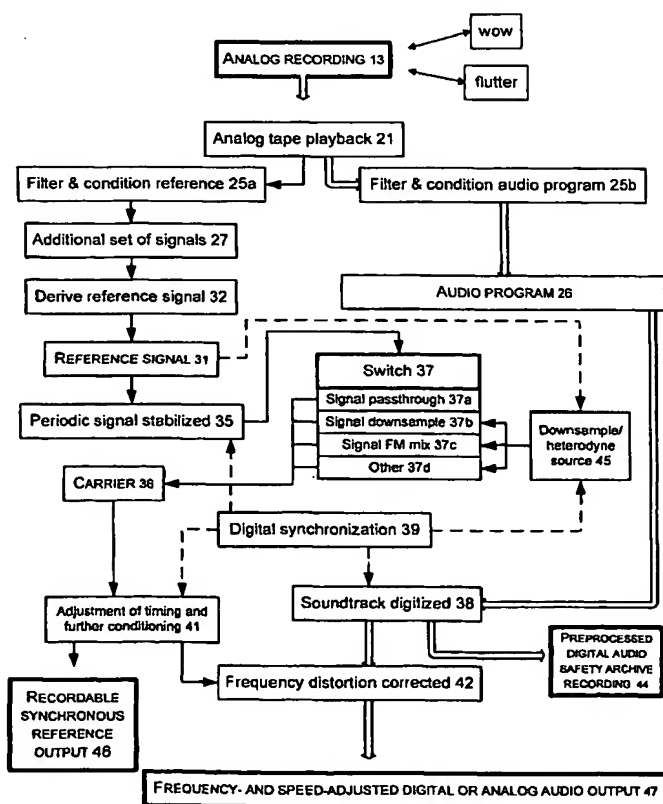
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(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),

[Continued on next page]

(54) Title: CORRECTIVE ADJUSTMENT OF RECORDING CHARACTERISTICS IN DIGITAL RENDITIONS OF ANALOG RECORDINGS



(57) Abstract: A signal reconstruction technique is used to correct for wow and flutter in analog audio recordings. Elements of the recording are used to generate a signal for correcting the output. Involves locating modulated entities such as bias signal (e.g. frequency-modulated, amplitude-modulated, or phase-modulated entities) in the recording, extracting them, and utilizing them as a carrier to synchronize to a master clock, using the irregularity of the anomaly to indicate the speed and pitch information to be corrected. A carrier frequency is determined and applied to a digitized form of the recording. This may be performed even in the absence of a prescribed reference code or tone, such as a pilot tone laid down purposefully at the moment of recording. In the case of signals presumed to have an error in the carrier, a corresponding signal is buffered, and in the case of a presumed error, a last known signal is used for the duration of the error.

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Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— *with international search report*

(88) Date of publication of the international search report:

29 December 2004

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/31771

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06F 17/00; G11B 5/09

US CL : 360/32, 51; 700/94; 369/47.29

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 360/32, 51; 700/94; 369/47.29, 47.16; 341/118,155

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
BRS, see attached

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,748,397 A (YAMADA) 05 May 1998 (05.05.1998), col. 2, lines 15-31	1, 6
A	US 5,708,723 A (NISHINO) 13 January 1998 (13.01.1998), Abstract	1,6
A	US 3,832,045 A (WILSON et al) 27 August 1974 (27.08.1974), Abstract	1, 6
X	US 5,644,307 A (FUKUDA) 01 July 1997 (01.07.1997), col. 1, line 15	37-38



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another claim or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

19 August 2004 (19.08.2004)

Date of mailing of the international search report

10 September 2004 (10.09.2004)

08 OCT 2004

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/31771

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claim Nos.: 39 and 40
because they relate to subject matter not required to be searched by this Authority, namely:
just a library of art work and text; nothing executable is present
2. ☐ Claim Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to
such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule
6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all
searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite
payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report
covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is
restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-10 and 37-40

Remark on Protest

☐
☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

PCT/US03/31771

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

Group I: Claims 1-10 and 37-40 are drawn to a method of adjusting timing and pitch in a digitized wideband playback signal in response to a reference signal derived from either a wideband analog playback signal or the digitized wideband playback signal.

Group II: Claims 11-21 drawn to a method of filtering.

Group III: Claims 22-29 drawn to a method and apparatus of correcting for dropouts.

Group IV: Claims 30-36 drawn to a method of signal reconstruction through obtaining a speed variation function.

The inventions listed as Groups I-IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Groups II-IV do not have the reference signal generation and periodic deviation aspects of Group I. Groups I and III-IV do not have the filtering elements of Group II. Groups I-II and IV do not mention the method of correcting for drop-outs presented in Group III. Finally, Groups I-III do not mention obtaining a speed variation function as described in Group IV.